

From these tables it will be seen that land and sea breezes up to an altitude of 400 meters maintain practically the same direction as at the surface. The wind direction above turns counter clockwise with ascent in the morning and clockwise in the afternoon. The alternation of the land and sea breeze completely disappears at 1,000 meters, but still higher the turning of the wind counterclockwise in the morning and clockwise in the afternoon is observed. The directions are opposite at 2,500 meters and become the same again at 4,000 meters.—*R. H. W.*

THE SEA BREEZE ON THE COAST OF CATALONIA.

[Sobre los vientos estivals de conveccio a la costa Cataluna, per Eduard Fontseré, Professor a la Facultat de Ciencias de Barcelona, Director de la Estacion Aerologica. Barcelona, 1918.]

Amongst the numerous meteorological phenomena of which the general principles are known but the details vague, land and sea breezes occupy a leading place. No adequate study of the subject has been made in this country [British Isles], and Prof. Fontseré's memoir, which is devoted to the winds of the Spanish coast of the Mediterranean, may be welcomed as showing the right line of investigation. A large number of observers were found who collaborated in keeping records of the wind throughout day and night, noting the strength and direction every few hours and also the times of onset of the land and sea breezes and other salient changes. By combining the information collected from these observers with the results of the observations at the aeronautical station an adequate picture of the air movements could be constructed.

THE FIRST SUCCESSFUL NON-STOP TRANS-ATLANTIC FLIGHT.

Within less than a month after the successful crossing of the Atlantic by the NC-4 a non-stop flight direct from Newfoundland to Ireland was made by Capt. John Alcock, pilot, and Lieut. Arthur W. Brown, navigator, of the British Royal Air Force. The Newfoundland coast was crossed at 5:28 p. m., Greenwich meridian time, June 14, and the Irish coast at 9:25 a. m., June 15, the entire distance of 3,040 kilometers, or 1,890 statute miles, having thus been traversed in practically 16 hours. If we assume that there were few deviations from a great circle course and that little time was lost in changing altitude, it appears that on the average an actual speed of about 53 m. p. s., or 118.5 m. p. h., was maintained.

Wind conditions for the flight were very nearly ideal, for not only did they furnish an average assistance of approximately 12 m. p. s., 25 to 30 m. p. h., but their direction was such (see Charts X and XI) as to enable the aviators to keep their machine true to course in spite of the handicap due to inability to check that course by means of observations. The weather, aside from the wind, was most unfavorable, as indicated in the published reports of the aviators. We quote from *Nature*, London, June 19, 1919, p. 306:

"Clouds were met at all altitudes (including dense fog in the lower levels) and it was generally impossible to see either ocean or sky. At the higher altitudes the machine became covered with ice, and at one time the air-speed indicator became clogged. The sense of horizontality was for the time lost, and the machine executed various evolutions until it had fallen so low that the sea

Although the prevailing upper currents across the coast in summer are from northwest, the land breeze is not developed with the same regularity as the sea breeze. On the coast line the sea breeze reaches its maximum strength about 13h. and it gradually works its way inland, the maximum at 30 kilometers or so from the coast occurring at 17h. The maximum sea breeze comes from the south, making an angle of about 45° with the shore, and the return current (in the layer from 1,000 to 3,000 meters) is from the west, so that the air tracks are flattened helices some 50 kilometers wide and 3 kilometers high. The ascending part of each helix is indicated by cumulus cloud, near the coast at midday, farther inland toward evening. Prof. Fontseré's work is provided with maps and diagrams which "talk" and would repay careful study.—*Met. Off. Circ. 34, Apr. 1, 1919, p. 4.*

LAND AND SEA BREEZES AT SIERRA LEONE.

[Met. Off. Circ. 3, Aug. 21, 1916, p. 4.]

The following figures, compiled from the original returns, show how different the prevailing winds at Sierra Leone are in the morning and evening:

	9h.			17h.		
	Frequency of winds from—					
	NE., E., SE.	W., SW.	Calms, etc.	NE., E., SE.	W., SW.	Calms, etc.
Winter, 90 days (Dec.—Feb.)	54	4	22	1	46	43
Spring, 92 days (Mar.—May)	52	27	13	1	65	
Summer, 92 days (June—Aug.)	30	31	31	1	58	
Autumn, 91 days (Sept.—Nov.)	53	13	25	0	66	25

became visible, and Capt. Alcock was able to recover a normal attitude.

"Only four observations of position were taken during the flight, these being made with reference to the sun, the moon, the pole star and Vega, respectively. All ships were warned that the flight was taking place, and asked to wireless their positions, but the aviators received no messages to guide them, and were entirely dependent on their own scanty observations.

"The average altitude was about 4,000 feet, but attempts were made to find better atmospheric conditions at various altitudes up to 11,000 feet without success."

From the foregoing it is evident, as has been stated elsewhere, that wind assistance is of prime importance. In the absence of radio reports from ships at sea and of observations with greater frequency than were made it would have been practically impossible to steer the correct course that was maintained without winds almost exactly parallel to that course. Moreover, the experience of Alcock and Brown, as well as that of the NC planes, Hawker and Grieve, and more recently the British dirigible R 34, shows that days with favorable weather for observational purposes are rare indeed, at least for any considerable portion of the journey. Hence a flight, if started during adverse wind conditions, is almost certain to meet with failure, until more efficient radiodirectional apparatus is perfected or until aircraft are produced of such speed as to be relatively independent of winds that are ordinarily encountered.—*W. R. Gregg.*